The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JOHN C. EIDSON

Appeal No. 2005-2110
Application No. 09/205,115

ON BRIEF

Before THOMAS, KRASS and SAADAT, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

Decision On Appeal

This is a decision on appeal from the final rejection of claims 18-37.

The invention pertains to controlling motion using time synchronization. In particular, a set of control nodes is provided, with each control node coordinated via network communication and time synchronization. Each control node controls the motion of only a single axis of a motion control

system so that the amount of control node hardware deployed may be matched to the number of motion axes being controlled.

Representative independent claim 27 is reproduced as follows:

27. A method for controlling a set of axes of a motion control system, comprising the steps of:

for each axis, obtaining a set of information via a network that pertains to a control value to be applied to the axis;

for each axis, applying the control value to the axis when a trigger time associated with the control value matches a time in a clock associated with the axis such that application of the control values to the axes is coordinated by the trigger times and synchronizing the times in the clocks.

The examiner relies on the following references:

Evans	4,514,814	Apr. 30, 1985
Kawamura et al. (Kawamura)	5,146,410	Sep. 08, 1992
Eidson et al. (Eidson)	5,566,180	Oct. 15, 1996

Claims 18-37 stand rejected under 35 U.S.C. § 103 as unpatentable, alternatively, over either Kawamura and Eidson, or Kawamura, Eidson and Evans.

Reference is made to the briefs and answer for the respective positions of appellant and the examiner.

OPINION

The examiner contends that Kawamura discloses the claimed subject matter but for clocks with synchronization time specified. The examiner points to columns 1-5 of Eidson for a "synchronized clock system with nodes including clocks synchronized by a protocol over a network for industrial process facilities monitoring and control," concluding that it would have been obvious to have included in Kawamura the axis circuits or nodes including clocks synchronized by a protocol over a network disclosed in Eidson "to assure successful operation of for [sic] systems such as process control which depends on accurately knowing times for applying control signals at known times and suggested by Kawamura disclosing machine control and with execution times suggestive of process facilities with clock synchronization in Eidson" (answer-page 4).

Alternatively, the examiner contends that Evans discloses an analogous axis control system with independently controlled axes, coordinating motion of several axes by programmable grouping. Therefore, the examiner contends that if an independent control is not clear from the combination of Kawamura and Eidson, Evans' disclosure would have made it obvious to include independent control for providing desired motion as suggested by column 2,

lines 42-46, of Kawamura, disclosing that the grouping maybe varied according to commands from the PWC (answer-page 5).

For his part, appellant argues that Kawamura does not disclose or suggest a control node for controlling a single axis of a motion control, but, rather, it discloses a control apparatus 20 for controlling three axes of a motion control system, at column 2, lines 18-21. Appellant contends that Kawamura's system is an example of the prior art over which the instant invention is an improvement (principal brief-pages 5-6).

While the examiner points to circuits 24-26 of Kawamura as nodes for controlling motion, appellant submits that these axis control circuits of Kawamura are not control nodes that are responsive to information obtained via a network as are the control nodes claimed (principal brief-page 6). Appellant points to column 2, lines 22-24, of Kawamura to show that the commands in buffers 21-23 of Kawamura are sent from the programmable machine controller (PMC) 10 to control apparatus 20 via a common RAM. Appellant contrasts this with the instant claimed invention, wherein a control node controls only a single axis and obtains information for controlling its axis via a network (principal brief-page 6).

Moreover, appellant argues that Kawamura and Eidson do not disclose or suggest a control node that applies a control value to an axis of a motion control system when a trigger time associated with the control value matches a time in a clock in the control node, as claimed.

Instead, argues appellant, Kawamura discloses a control apparatus 20 that starts applying pulses to its axis when all commands are received by the control apparatus 20 (Kawamura, column 1, lines 59-64) (principal brief-page 7).

Further, appellant contends that Kawamura does not disclose or suggest a trigger time associated with a control value or a clock in the control apparatus 20 that holds a time that may be compared to a trigger time, as claimed. In particular, appellant contends that execution times Ta and Te of Kawamura are not trigger times, as claimed, but, rather, are time intervals for distributing pulses (Kawamura, abstract, lines 12-13) (principal brief-page 7).

Still further, appellant contends that Kawamura and Eidson do not disclose or suggest coordinating the application of control values to multiple axes of a motion control system by associating trigger times to control values, as claimed. Instead, argues appellant, Kawamura discloses, at column 1, lines

65-68, that multiple axes may be started at the same time by grouping together axes. Appellant also points out that Eidson discloses clock synchronization for nodes in a distributed network, rather than coordinating the application of control values to the axes of a motion control system, as claimed (principal brief-pages 8-9).

Even further, appellant argues that there is no motivation to combine the references. In particular, appellant argues that the artisan would not have been motivated to provide each access control circuit 24-26 of Kawamura with its own synchronized clock as taught by Eidson because the access control circuits 24-26 are contained in the same control apparatus 20 and are not subject to network latency and jitter that the teachings of Eidson are intended to overcome (Eidson, column 1, lines 47-55) (principal brief-page 9). Moreover, appellant argues, since the control circuits 24-26 are in the same control apparatus 20, they could share a clock, and would not need a separate clock for each circuit.

With regard to the alternative rejection, appellant argues that Evans does not provide for the argued deficiencies of Kawamura and Eidson in that Evans does not disclose or suggest a control node for controlling a single axis of a motion control

system, as claimed, but, rather, Evans discloses a set of axis boards, each for controlling multiple axes (column 3, lines 1-6).

We have reviewed the evidence before us, including the arguments of appellant and the examiner, and we conclude therefrom that the examiner has not established a prima facie case of obviousness with regard to the instant claimed subject matter. Accordingly, we will not sustain the rejections of claims 18-37 under 35 U.S.C. § 103.

While the examiner appears to take the position that Kawamura discloses the claimed subject matter but for clocks with synchronization times specified, we do not agree. At first glance, Kawamura appears promising as a valuable reference in a rejection of the instant claims, disclosing command values for axes in a motion control system, with pulses distributed within execution times. However, a closer inspection of the reference reveals some deficiencies.

Taking instant claim 27 as exemplary, as the examiner has done, the claim requires that for each axis, a set of information is obtained via a network that pertains to a control value to be applied to the axis. There is no discussion of any information being obtained from a network in Kawamura. In fact, all information with respect to the grouping of the axes and the

execution times for the axes in Kawamura is received from the PMC 10.

While it is unclear in Kawamura whether the information received from the PMC pertains to a control value to be applied to each axis, let us assume, arguendo, that since pulses are distributed within the execution times provided by the PMC, it may be considered that the PMC does provide information pertaining to a control value to be applied to each axis. Even so, in accordance with the instant claims, these control values must be applied to each axis "when a trigger time associated with the control value matches a time in a clock associated with the axis such that the application of the control values to the axes is coordinated by the trigger times and synchronizing the times in the clocks." The examiner says that the trigger times are the Ta and Te execution times in Kawamura. But even if these execution times are considered to be "trigger times," the execution times are not matched to a time in a clock associated with the axis, as claimed, because there is no clock associated with each axis in Kawamura.

Of course, the examiner recognized the absence of a clock for each axis in Kawamura and therefore relied on Eidson. However, we find nothing in Eidson that would have suggested

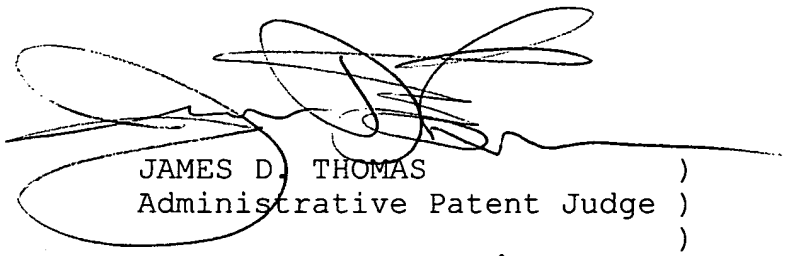
employing a clock on each axis of Kawamura. The examiner does not even point to anything specific in Eidson on which he relies, instead broadly identifying columns 1-5 for some unidentified teaching of a "synchronized clock system with nodes including clocks synchronized by a protocol over a network for industrial process facilities monitoring and control."

Even assuming that Eidson discloses all that the examiner contends that it does, the examiner still has presented no convincing reason that the artisan would have taken anything from Eidson that would have led that artisan to provide for a clock in each of the axes in Kawamura and, further, to then somehow match that clock in each of the axes to a trigger time associated with the control value in each axis, as required by the instant claims. Clearly, the only way for the examiner to have found such a modification obvious would have been through impermissible hindsight.

Moreover, we do not find anything in the cited Evans reference to remedy the deficiencies of Kawamura and Eidson.

Accordingly, the examiner's decision rejecting claims 18-37 under 35 U.S.C. § 103 is reversed.

REVERSED



JAMES D. THOMAS)
Administrative Patent Judge)
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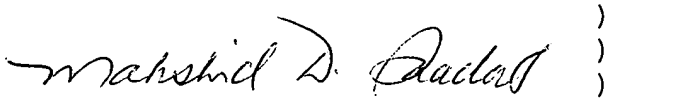
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